State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
910 Hwy 54 East
Black River Falls WI 54615

Scott Walker, Governor
Dan Meyer, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

Wisconsin Department of Natural Resources Ruling Declaring the Location of the Ordinary High Water Mark of Lake Michigan on the Shore of a Parcel of Land Located at 92 East Maple St. ("Parcel 92") in the City of Sturgeon Bay, Door County, Wisconsin February 5, 2018

TABLE OF CONTENTS

Table of Figures

INTRODUCTION

The Department of Natural Resources (Department), on a petition and as authorized by s. 227.41, Wis. Stats., issues this ruling declaring the location of the ordinary high water mark ("OHWM") of Lake Michigan along the shore of a parcel of land located at 92 E. Maple St. ("Parcel 92") in the City of Sturgeon Bay, Door County, Wisconsin (Figure 1). This ruling determines the location of the OHWM only on Parcel 92 and applies the Wisconsin legal standards described herein to fulfill the state's affirmative duty under Article IX, Sec. 1 of the Wisconsin Constitution to protect the public trust in navigable waters of the state [*Muench v. Pub. Serv. Comm'n, 261 Wis. 492, 512 (1952)*] and provide consistency and efficiency in state administration of water resource laws (chs. 30 and 31, Wis. Stats.)

BACKGROUND

Parcel 92: The petition seeking an OHWM determination at Parcel 92 was prompted by efforts of the City of Sturgeon Bay ("City") to redevelop two parcels located on the west side of Sturgeon Bay, north of the Oregon Street Bridge. The City proposes commercial development on adjacent Parcels 92 and 100. Several local citizens and the Friends of Sturgeon Bay Public Waterfront (FSBPW) oppose the plan of development the City proposed because they allege it allows private development on parcels created or enlarged by filling lakebed. They allege that artificially filled lakebed is subject to the public trust imposed on navigable waters and their beds in Wisconsin, and that under Wisconsin law the OHWM constitutes the landward boundary of the navigable waters and lakebed held in public trust by the state.

On March 8, 2017, the Department received a petition from the FSBPW and six individuals requesting a full hearing and declaratory ruling pursuant to s. 227.41, Wis. Stats., to make a finding of the location of the OWHM on a parcel of property located at 92 East Maple Street in the City of Sturgeon Bay (Parcel 92) for the purposes of determining the extent of the state's property rights under the Public Trust Doctrine and Wisconsin Constitution, Article IX, Sec. 1.

On August 25 and 26, 2017, notices of public hearing were published on the Department's website and in the *Door County Advocate* newspaper, respectively. On September 6, 2017, the Department held a public hearing to receive comments, provide information and respond to clarifying questions regarding the location of the OHWM on Sturgeon Bay at 92 East Maple St. (Parcel 92), City of Sturgeon Bay, Wisconsin. Thirty-five attendees filled out public hearing appearance slips (Appendix A) and approximately 24 people addressed the hearing examiner. The hearing closed September 6th and the public comment period remained open through September 15, 2017. The Department has reviewed all the public comments, historical maps, documents, figures, and photos submitted at the public hearing and during the public comment period.

Parcel 100: Parcel 100 is adjacent to Parcel 92. By letter dated October 20, 2014 (Concurrence), the Department concurred with the location of the OHWM on Parcel 100 as shown and described in a "Plat of Survey" created for the City and dated October 2, 2014 (Bruhn, 2014). The City recorded the Concurrence, the attached map and surveyed description with the Door County Register of Deeds as Document No. 782928. In its Concurrence, the Department acknowledged that historic filling of lakebed on Parcel 100 had obliterated the typical field characteristics the Department uses to establish an OHWM. In crafting the Parcel 100 Concurrence Department staff reviewed historic maps to determine whether the Department concurred with the OHWM for Parcel 100 proposed by the City.

After reviewing several maps (including a U.S. Corps of Engineers 1925 map showing low water depths in Sturgeon Bay), the Department concluded that the shallow water depths along a certain portion of the Parcel 100 shoreline shown on the 1925 map would have filled with sediment, gradually accreting against the shore of Parcel 100 to form upland. Wisconsin common law has long held that a riparian owner has "the right … to accretions formed by slow and imperceptible degrees upon or against his land…" *Boorman v. Sunnuchs*, 42 Wis. 233, 242 (1877). Wisconsin courts have used a classical definition of "accretion" as "the increase in land caused by the gradual deposit by water of materials on the shores, which deposit replaces the water at this location with dry land." *De Simon v. Kramer*, 77 Wis. 2d 188 (1977), citing *Baldwin v. Anderson*, 40 Wis. 2d 33, 44 (1968). Title to land formed by accretion upon or against a riparian's shore vests in the riparian owner, *id*., and the adjacent water acts upon the newly created land to eventually establish a new OHWM on the enlarged shoreline. Based on the premise that sediment in the waters and eroded materials entering the waters from shore had accreted against the existing shore in the area between the two docks shown on the 1925 map, the Department concluded that the accreted materials had extended the upland in that area waterward as shown on the map and described in the surveyed description attached to the Concurrence.

Circuit Court Decision: Before filing this petition for a declaratory ruling, the petitioners and the City and the Waterfront Redevelopment Authority (WRA) litigated several issues regarding the proposed redevelopment of Parcels 92 and 100 in Door County Circuit Court. On March 13, 2017, the Door County Circuit Court entered a judgement finding that "the portion of Parcel 100 lying landward of the OHWM as found in the Concurrence… is owned by the City of Sturgeon Bay." The court also found that "the … Department … has not made an Ordinary High Water Mark ("OHWM") determination on Parcel 92" and "the court is unable to make a determination of the location of the OHWM on Parcel 92." The court enjoined the sale of Parcel 92 "absent some determination … by the … Department … as to where the actual ordinary high water mark is" on Parcel 92 (*FSBPW v. City of Sturgeon Bay, et. al*., Door County Case No. 16-CV-23 Findings 3-8. *Id.*).

At the Department's request and with consent of the attorneys for the City and the attorneys for FSBPW, all documents that comprise the record of the Door County Circuit Court case no. 16-CV-23 entitled "Friends of the Sturgeon Bay Public Waterfront et al. v. City of Sturgeon Bay and Waterfront Redevelopment Authority of the City of Sturgeon Bay," as well as copies of the briefs both parties filed in the City/WRA appeal of the circuit court decision in the Wisconsin Court of Appeals District III, Appeal No. 17-AP-000800, were reviewed and included in the public record for this hearing. The Department has reviewed all the trial documents from case no. 16-CV-23 provided by the petitioners' attorney.

DISCUSSION

Ordinary High Mark

The delineation of the ordinary high-water mark (OHWM) is a critical element in the administration of Wisconsin water law and is necessary for an effective water management program. The OHWM is the landward boundary between riparian owned uplands and publicly owned beds of natural lakes, *C. Beck Co. v. Milwaukee*, 139 Wis. 340, 351 (1909). Hence the OHWM demarcates the landward boundary of public rights and interest in the waters of navigable streams and lakes. The title to the beds of natural navigable waters was transferred from the United States to the state upon statehood, and that title was impressed with a public trust:

> *The United States never had title, in the Northwest Territory, out of which this state was carved, to the bed of lakes, ponds and navigable rivers, except in trust for public purposes; and its trust in that regard was transferred to the state, and must there continue forever, so far as necessary to the enjoyment thereof by the people of this commonwealth. Whatever concession the state may make without violating the essentials of the trust, it has been held, can properly be made to riparian proprietors, Illinois Steel Co. v. Bilot, 109 Wis. 418, 425 (1901).*

When Wisconsin became a state, title to the beds of all lakes in Wisconsin vested in the State to be held in trust for the people pursuant to the public trust doctrine. The State owns all the lakebed of a natural navigable lake, including lakebed in non-navigable areas (shoals) of the navigable lake. *State v. Trudeau*, 139 Wis. 2d 91, 103 (1987). The absolute title to the beds of navigable waters that the state receives upon statehood cannot be defeated even by a later federal patent relating to the lands. *State Land Board v. Corvallis Sand & Gravel Co*., 429 U.S. 363 (1977) and *Angelo v. Railroad Commission,* 194 Wis. 543, 550, 217 N.W. 570 (1928). In three 1877 cases, the Wisconsin Supreme Court addressed the issue of what comprises the boundary between state owned lakebed and riparian owned upland abutting a natural navigable lake. The Wisconsin Supreme Court held that a riparian owner takes to the "natural shore," "edge of the water in its ordinary condition," or "water's edge" of a natural lake, but did not specify what those terms meant. *Delaplaine v. Railway Co.*, 42 Wis. 214 (1877); *Boorman v. Sunnuchs*, 42 Wis. 233 (1877); *Diedrich v. Northwestern Union Ry. Co*., 42 Wis. 248 (1877)

In 1909, the Wisconsin Supreme Court specified what comprised the boundary between lakebed and upland by using (but not defining) the term "ordinary high water mark" *C. Beck Co. v. Milwaukee*, 139 Wis. 340, 351 (1909). In 1911, the Wisconsin Supreme Court first defined the term "ordinary high-water mark" in *Lawrence v. American Writing Paper Co.* (1911), 144 Wis. 556, 562 (1911):

> *...ordinary high-water mark, that is the point up to which the presence and action of the water is so continuous as to leave a distinct mark by erosion, destruction of vegetation, or other easily recognized characteristic.*

Three years later in *Diana Shooting Club v. Husting*, 156 Wis. 261, 272 (1914), the Wisconsin Supreme Court redefined and expanded its earlier definition of OHWM:

> *By ordinary high-water mark is meant the point on the bank or shore up to which the presence and action of the water is so continuous as to leave a distinct mark either by erosion, destruction of terrestrial vegetation, or other easily recognized characteristic. And where the bank or shore at any particular place is of such a character that it is impossible or difficult to ascertain where the point of ordinary high-water mark is, recourse may be had to other places on the bank or shore of the same stream or lake to determine whether a given stage of water is above or below the ordinary high-water mark.*

Methods to Determine the Location of the OHWM

As standard practice, the Department determines the OHWM location at a site by visiting the site to look for and analyze physical and biological indicators that indicate the presence and action of water on a recurring enough basis to leave a distinct mark or other easily recognized characteristic (WDNR, 2013). Indicators include biological indicators such as mosses, lichens, and hydrophilic plants that survive or thrive in an area wetted or submerged by water on a recurring basis; tree growth patterns that indicate the recurring presence of water (e.g., water roots, pancake roots, and pipe elbow roots); and physical phenomena that indicate the presence or action of water or ice on a recurring basis (e.g., ice scars, erosion, mud and water stains and leachate marks on the soils). Under normal conditions, the tall strong waves and ice typical on the Great Lakes usually rise above the static water level of the lake and leave the most distinct marks, so the OHWM along a Great Lakes shoreline is usually located higher than the static water levels, although the Department has not documented the relationship between the water's edge (i.e., shoreline) and OHWMs.

Unfortunately, historic filling, paving, and development of Parcel 92 has destroyed the typical physical and biological field indicators on Parcel 92, and there is no nearby relatively undisturbed protected shore where an OHWM can be determined, surveyed, and transferred as the Wisconsin Supreme Court noted in *Diana Shooting Club* and accepted in *State v. Trudeau*, 139 Wis. 2d 91 (1987). The Wisconsin Supreme Court has rejected at least one OHWM determination based solely on average water level**.** *State v. McDonald Lumber Co.*, 18 Wis.2d 173, 176-77 (1962)**.**

"Meander line" means "a usually irregular line following the outline of a body of water that is used to measure abutting property and is not a boundary line" (Merriam-Webster, 2017). The Wisconsin Supreme Court has held that the state holds title to beds of all natural navigable lakes, meandered or not, noting that meander lines in original U.S. government surveys were not run as boundaries but only to define "the sinuosities of the banks of the water" and ascertain the quantity of land subject to sale. *Baker v. Voss*, 217 Wis. 415, 417, 259 N.W.2d 413 (1935); *Weaver, v. Knudson*, 23 Wis. 2d 426, 431(1964).

These cases implicitly reject relying solely on a meander line as the OHWM (boundary between upland and lakebed) since lakes without meander lines also need a boundary between state ownership and riparian ownership. The purpose of setting meander lines and how they were surveyed indicates their limitations in determining where the OHWM was when the meander line was set: surveyors typically walked the lines of each 1 mile square section, setting a post at the shoreline of any lake or river of significant size that intersected the section line they were walking. Once they set posts on all section lines intersecting a lake or river, they surveyed the shoreline by connecting the meander corners by tangential lines (BCPL, 2018).

Maps showing the water's edge on a fixed date also are of limited use in determining the location of the *OHWM* on that date. Though the 1877 Wisconsin Supreme Court cases noted above hold that a riparian owner takes to the "natural shore," "edge of the water in its ordinary condition," or "water's edge" of a natural lake, later cases clarified that those terms mean the OHWM. The edge of a water body fluctuates, advancing and receding upon a shore depending on various factors, but the OHWM is found at a level and location upon the shore where water's presence and action is continuous enough to leave a mark. Waves, wind, and ice cause water to act upon the shore above the static level of the surface of a waterbody, and the action of the water upon the shore must recur often enough over time to create a distinct mark. Thus, maps showing the water's edge (the static water level) on a chosen date are not conclusive as to the OHWM location on that date.

Delineation of the OHWM at even natural, undisturbed Great Lakes shorelines can be complicated by several Great Lakes attributes (Norton, Meadows, & Meadows, 2013), including the following:

- The Great Lakes are geologically young features and the shorelines are highly susceptible to ongoing water level fluctuations;

- Great Lakes water levels oscillate naturally on seasonal, decadal, and multi-decadal timeframes creating periods of "ordinary high water" that rise and fall;
- The Great Lakes experience regional storm patterns that exacerbate shoreline changes resulting from water level fluctuations;
- The entire Great Lakes basin is also gradually rising following the melting of the glaciers 14,000 years ago. This rising or decompression of the basin results in erosion rates that differ from southern shores to the northern shores of Lake Michigan (as cited in Norton et al., 2013).

Recognizing the limitations noted above, the Department has proceeded to determine the OHWM at Parcel 92 using the only methods available for this site, which include reviewing historical maps, soil borings, data in figures and tables, and historical photos. The Department recognizes this is not the typical methodology used to determine an OHWM, but is limited to using the information available to reach a reasonable determination.

Historic Water Levels

Historic and present-day Lake Michigan water level fluctuations are well documented and analyzed (Lenters, 2001; Wilcox, 2007). Lake Michigan, like other Great Lakes, is rimmed by coastal features and associated sedimentary deposits going back at least 14,000 years (Wilcox, 2007; Quinn, 2006; FEMA, 2012). More recently, water levels on Lake Michigan have been continuously recorded since 1861 (*Figure* 2) and have fluctuated over six feet in recorded history, with a maximum of 582.35 ft. (GLBHHD, 1992) in June 1986 and a minimum of 576.02 ft. in January 2013. Periods of higher water levels were recorded in the late 1800s, the late 1920s, the mid-1950s, and from the early 1970s to mid-1980s. Lower water levels were recorded in the mid-1920s, the mid-1930s, the mid-1960s and in 1999 (Wilcox, 2007).

Quinn and Sellinger (1990) examined other intermittent Lake Michigan water level measurements in the early 1800s, and although not measured directly, paleo-scientists have estimated historical Lake Michigan water levels back to the 1600s (Quinn, 2006). The paleo-record (*Figure* 3) and intermittent measures of water levels (*Figure* 4) for Lake Michigan at the time of Statehood in 1848 show lower water levels than when the meander line was mapped during the 1835 government survey. The 1873, 1885, and 1888 Bay View plat maps were created during a period of higher water levels on Lake Michigan. The 1925, 1942 and 1950 ACOE navigation charts were created during periods of generally lower water levels.

Since the elevation of the lake's water affects the location of the lake's shoreline, changes in water level are important when considering the locations of shorelines depicted on historic maps and navigation charts. As water levels rise, the water reaches further landward; as water levels lower, the shoreline recedes waterward. How far the actual water's edge moves in either direction depends on shore topography or shoreline slope and lakebed bathymetry. A water level increase of 6 inches may move the shoreline many feet landward on a gently sloping shore, only a couple of feet at a steeply sloping shore, and not at all on a shore with a vertical height greater than 6 inches. Conversely, a water decrease of 6 inches may move the shore waterward many feet or hardly at all depending on the topography of the shore and bathymetry of the lakebed in that area.

A mapped shoreline is a snapshot that reflects where the shore was located when the map was created and according to whatever mapping protocols were used to establish the shoreline location. If the water stayed at a mapped shoreline location long enough to create the marks of the presence and action of water on the shore that indicate an OHWM, the OHWM likely would have a higher elevation than the elevation of the lake static water level and likely would be located landward of a mapped shoreline because waves and ice usually reach above the static water level. If the water did not stay at a mapped shoreline location long enough to create OHWM indicators, the OHWM would have remained at the last elevation and location where the presence and action of the water had persisted long enough to create such marks. That OHWM elevation and location could be landward

of the mapped temporarily lower water level/shoreline or waterward (i.e., a submerged OHWM) of the mapped temporarily higher water level/shoreline.

Accretion and Fill

Accretion is "the increase in land caused by the gradual deposit by water of materials on the shores, which deposit replaces the water at this location with dry land." *De Simon v. Kramer*, 77 Wis. 2d 188 (1977), citing *Baldwin v. Anderson*, 40 Wis. 2d 33, 44 (1968). In contrast, fill is material (including soil, rocks, and waste) placed by human action waterward of the OHWM that has the effect of replacing any portion of water with dry land, or changing the bottom elevation of a water. Shoreline accretion occurs slowly over time through natural processes of erosion and sedimentation deposition since sediment must be transported and accumulate along the shoreline. Sediment transport is complicated and a function of many variables including water depth, particle diameter and density, fluid density and water viscosity.

The Wisconsin Supreme Court applied the classical definition of "accretion" to hold that a riparian owner has "the right … to accretions formed by slow and imperceptible degrees upon or against his land…" *Boorman v. Sunnuchs*, 42 Wis. 233, 242 (1877). The Wisconsin Supreme Court also has held that in certain circumstances the doctrine that a riparian owner takes title to accretions upon or against his land includes taking title to fill placed by human action. *De Simone v. Kramer*, 77 Wis. 2d 188 (1977); *W.H. Pugh Coal Co. v. State*, 105 Wis.2d 123 (1981). Whether the doctrine of accretion must apply to the areas filled by humans on Parcel 92 and the effect of such application on the location of the OHWM at this site is discussed later in this document.

Parcel 100 Accretion: Based upon a 1925 U.S. War Department map image showing water depths and the location of two dock structures, the Department concluded in the Concurrence that portions of Parcel 100 accreted because between 1925 and 1955 those areas slowly filled with sediment that replaced the water that had been there. Thus, the Department concurred with the approximate OHWM location delineated on the Plat of Survey prepared by Baudhuin Incorporated on October 2, 2014 which is part of Tax Parcel No. 281-2415090101 owned by the City. In its Judgment and Findings of Fact Nos. 8 & 9 in case no. 16-CV-23, the Door County circuit court accepted the OHWM noted in the Concurrence. That Concurrence is not invalidated by this declaratory ruling, which deals only with Parcel 92.

Parcel 92 Activities and Materials: Historic documents clearly establish that substantial areas of Parcel 92 were filled. In August 1873, Mr. Joseph Harris laid out and recorded a Plat of the Village of Bay View on land he owned. Fill may have been placed on Parcel 92 in 1878 or even earlier; in February 1878, a local newspaper first reported that Mr. Harris had begun extending his dock into deep water on the west shore of the bay but does not specify if the dock being extended into deep water was an existing dock or a new one being built. Regardless, in March 1878, the Legislature enacted 1878 Act 82 which authorized and empowered Mr. Harris:

> *to build and maintain a dock and pier, extending into Sturgeon Bay, on the western shore, from section seven (7), in township twenty-seven (27) north, of range twenty-six (26) east, in Door county, running in a northerly direction three hundred feet or more, to the usual steamboat channel, for the purpose of a steamboat dock and landing at the village of Bay View, on said Sturgeon Bay.*

Legislative Act: The record is uncertain as to about when Mr. Harris began building his dock and pier or if he placed any fill when he began building his dock and pier, but the 1878 Act 82 did not grant Mr. Harris the right to place fill or convey title or other interest in the lakebed to him. Seven months before the legislature enacted Act 82, three 1877 Wisconsin Supreme Court decisions (previously cited: *Delaplaine*; *Boorman;* and *Diedrich*) clarified the boundary between state-owned lakebed and privately held riparian upland. Those three decisions also clarified that a riparian has a qualified right to place a pier on lakebed, but that pier right was attached to holding title to the riparian land, not to holding title to the lakebed, and was a right subject to the public right of

navigation. In *Diedrich*, the respondent or *someone under whom he claimed* built an embankment extending 85 feet into the lake from the natural shore in front of riparian land the respondent owned, and respondent premised his case upon a claim of title to the embankment. But the Court held that (1) respondent's title, *and that of all persons under whom he claims*, was as an owner of riparian land bounded by the lake; (2) respondent's title extended only to the natural shore of the lake; and (3) respondent's title did not include title to the bed of the lake within its natural shore, since that title and use is in the public. The legislature knew how to grant the right to place fill on state owned lakebed, but granted Mr. Harris only a privilege as a riparian to build and maintain a dock and pier; it did not grant him a right to place fill around or under the dock.

Newspaper Accounts: There was substantial testimony at the public hearing documenting filling on Parcel 92 as early as 1892 (and possibly earlier). Maps, photographs and newspaper articles from 1878 to 1944 document that over the years the dock was lengthened and widened and a warehouse and other buildings were built on it. In March 1880 stone filled cribs to support the pier and dock planks were completed and a 60 ft. x 100 ft. structure on pilings was built - apparently at the waterward end of the dock to extend the wharf into 11 ft. deep water. In 1881, a grain warehouse was built on the waterward end of the dock. In summer 1891 a fire destroyed a cold storage warehouse on the dock; in fall 1891 Charles Martin bought the dock from Mr. Harris. In January-February 1892 Mr. Martin began extending the dock farther waterward (first 75 ft., then 25 ft. more to a total of 100 ft.), moved the warehouse farther waterward onto a solid foundation, and filled the whole property and shoal waters with refuse from a shingle mill to "make a solid lot of the whole place." In 1892 substantial filling apparently began; expansion and filling continued apace through changes in ownership. In 1926 the timber and pilings under the grain elevator on the dock were replaced with concrete. In 1944, a fire destroyed a large L-shaped warehouse and planking surface of the dock leaving the grain elevator and "charred footings" of the dock. In the 1950s and 1960s, areas of Parcel 92 were reconstructed with dock structures and buildings. Table 1 summarizes information documented from public hearing testimony.

Table 1. Information from public testimony submitted at the public hearing regarding the dock at Parcel 92.

STATEHOOD-1873 Pre-Development	1873 Shoreline mapped on **1873 Plat of Bay View**, Joseph Harris acknowledged by City as owner/proprietor of all the lands in the Bay View subdivision.
1878-1891 HARRIS DOCK (*Harris Dock*, 1891 Sanborn)	**February 1878**, "A gang of men and teams are engaged in extending Mr. Harris' dock into deep water, on the west shore of the bay". **March 1878**, by State Legislative Act, "Joseph Harris... authorized to build and maintain a dock and pier extending into Sturgeon Bay, on the western shore, ... running in a northerly direction 300 feet or more". *Historical articles and maps confirm riparian owner's dock building, extending, filling, warehouse building.* **1879**, completion of the Sturgeon Bay Shipping Canal, linking Sturgeon Bay to Lake Michigan.
1891-1897 MARTIN DOCK	**1891**, Charles I. Martin acquires Harris dock and buildings from Henry Harris who inherited from Joseph Harris Sr. *Historical articles and maps confirm new building, substantial dock extension in length and width, filling under dock.* **1894**, the Ahnapee and Western Railway connects Sturgeon Bay (at the west waterfront) to the entire midwest by rail.
1897-1903 LAWRENCE DOCK (*Lawrence Dock*, 1898 Sanborn)	**1897**, A.W. Lawrence acquires Martin dock and buildings in a Sheriff's deed following Martin's death. *Historical articles and maps confirm riparian owner's dock increased in length and width.* **1901**, Grain Elevator constructed on the dock (still standing in the present day).
1903-1953 TEWELES & BRANDEIS DOCK (*Teweles & Brandeis* and *Sawyer Dock* 1904, 1911, 1919 Sanborn)	**1903**, Teweles & Brandeis acquire dock and buildings from Lawrence. *Historical articles and maps confirm riparian owner's dock expansions, two new large warehouses, filling around dock.* **1931**, historic Michigan Street Bridge (Steel Bridge) constructed. **February 1944**, large fire destroys large L-shaped warehouses at end and side of dock and planking surface of dock in those areas. Remnant piers visible in subsequent photos. Dock (planking) surface is reduced in length and width; piers and artificial crib fill remains.
1953-2007 DOOR COUNTY COOPERATIVE DOCK	**1953**, Door County Cooperative acquires dock and buildings from Brandeis. *Historical articles, maps and photos confirm riparian owner's extensive new buildings and dock repair/extension.* **1956**, City quitclaims to Door County Cooperative a portion of side dock extension to accomodate a new building. **February 1964**, City quitclaims to DCC an additional portion of side dock extension, in area where 1958 Sanborn indicates water. **September 1964**, Filling behind new bulkhead in this area proceeds and scheduled to be completed that fall.

Soil Borings: In some cases, soil borings can identify fill and provide information helpful in delineating between fill and native layers. A series of previous environmental site assessments included many soil borings collected and analyzed in the general area of Parcel 92, and several people provided public comments specifically related to the soil borings collected for site assessments done on Parcel 92 and Parcel 100. The Department has reviewed the soil borings information included in the STS Consultants (STS, 2005) and Ayres & Associates (Ayres, 2015a) (Ayres, 2015b) phase II reports. The Department has also reviewed soil boring information from adjacent site assessments including the Tire Center, Bay Lake Bank, Brunswick Station, Door County Coop and Maritime Museum sites (*Figure* 5).

The Ayres report defined a lacustrine layer beneath fill at Parcel 92. Ayres defined the lacustrine deposit layer as "the lacustrine, or lake deposits, consist of discontinuous layers of poorly graded sand and gravel, silty sand and gravel, silt, and high plasticity clay of variable thickness" (Ayres, 2015b). The lacustrine layer was generally differentiated from FILL (bricks, cinders, concrete and wood debris). Several Unified Soil Classification System (USCS) codes were identified as lacustrine deposits including SM, SP, CH, ML and GM. The soil borings clearly document the top layers on Parcel 92 are fill. Soil borings from other nearby site assessments also identified a layer of fill on and around Parcel 92 ranging from 3 to 10 or more feet, but none of the other site assessments describe the native material layers below the fill as lacustrine. In the Door County Co-op site assessment, several soil layers containing "little shell fragments" were identified as alluvial in nature (STS, 1991). "Alluvial soil" is a

loose, unconsolidated soil which has been eroded and reshaped by water; it is a more general term than the similar term "lacustrine soil."

Legal Issues Regarding Accretion

The City has urged that the Department apply the holdings in *De Simone v. Kramer*, 77 Wis. 2d 188 (1963) and *W.H. Pugh Coal Company v. State*, 105 Wis.2d 123 (1981) to Parcel 92 and find that the City, as owner of Parcel 92, may apply the law regarding accretion to the fill and claim ownership as fast land of the fill placed on lakebed adjacent to Parcel 92 by the City's predecessors in title. Both the City and the FSBPW have submitted written arguments on this issue that are included as part of the hearing record. The Department has reviewed both cases and the arguments of the City and FSBPW, and does not believe the case holdings clearly compel such a result. Absent a clear unambiguous court or legislative action that further interprets and applies the holdings of these cases to fill placed by a predecessor in title, the Department lacks authority to extend those holdings to facts and parties that are unlike those considered by the court in the two cases. The Department notes that the unresolved legal question of whether a riparian may benefit from fill placed by a predecessor in title was specifically discussed by Harrington (1996) in his article:

> *Under the accretion theory, the private developer can argue the filling that was undertaken by a party who has no connection with the current owner operates to displace the state's public trust interest in the filled area. For example, if the area was filled with dredge spoil generated by the Corps of Engineers in connection with improvements in the adjoining harbor, the current owner will argue paramount right under the accretion theory.*
>
> *One of the questions that is unanswered under this theory is whether filling undertaken by a previous property owner would operate to defeat the accretion theory as a method to displace the state's interest in the filled area. **
>
> **The only reported accretion case that involved a competing state claim under the Public Trust Doctrine did not squarely face this issue. In Pugh, supra note 20, the state was unable to establish who had performed the filling involved in that case. It was unclear what effect, if any, the accretion theory would play on the displacement of the Public Trust Doctrine if the state had been able to establish that the filling had been caused by a predecessor with interest in title.*

(*emphasis added*) The Department also notes the law in Wisconsin is clear that an owner cannot convey more than they own to a successor in interest, so predecessor owners of Parcel could not have conveyed title to the filled land to any successors in interest. The Department assumes that a riparian claiming such interest would have to do so via a petition to the appropriate circuit court for a declaratory judgment or a quiet title action with appropriate notice to interested parties, including the state.

Previous OHWM Statements

The City suggested that the Department had already made an OHWM determination on Parcel 92 through statements made by Department Water Management Specialist Carrie Webb in 2013 and by former Department Waterways Section Chief Liesa Lehmann and former Department Waterways Attorney Megan Correll in 2013 and 2014 meetings, and that the City had reasonably relied on that determination. During the February 2017 trial in Door County Circuit Court, Ms. Webb testified that the Department "usually assumes that the shoreline that is shown on the survey is the ordinary high water mark" (page 150, 2nd day of trial transcript). But Ms. Webb also testified that she was only discussing Parcel 100 because the City was requesting title insurance and Department input on that parcel. Ms. Webb testified that she never established the OHWM on Parcel 92. In March 2017, Judge Huber found the DNR had not made an OHWM determination on Parcel 92.

DEPARTMENT DECISION RATIONALE

The Department recognizes the great amount of uncertainty in identifying an OHWM location at Parcel 92 and recognizes that because Parcel 92 has been filled for many years, the major remaining public trust interest to be protected at the site is the public's ability to access the filled lake bed for public purposes. Because of the uncertainties, the Department has declared a reasonable OHWM location that comports with state law, Department guidance, and practices used at other Great Lakes locations where normal OHWM indicators are not available, while recognizing the public's interest in preserving public uses of public trust lakebed at this site as well as the City's interest as a riparian in developing its private property.

The Department acknowledges that because of the historic fill and existing conditions on Parcel 92, the OHWM cannot be located on this site by finding physical and biological indicators that show that the presence and action of the water is continuous enough at a location to leave a distinct mark. With no other option, the Department determined the estimated location of the shoreline or water's edge in 1848 when the federal government transferred title for lakebeds to the State to hold in trust for the public, and then adjusted the shoreline boundary to account for accretion that occurred at Parcel 92 to determine the OHWM location.

Uncertainty Exists Using Mapped Shorelines or Meander Lines as OHWM Boundaries

None of the oral or written statements or documents provided during the public comment period or circuit court trial provide information about the specific OHWM indicators prescribed in Department guidance and case law. None of the maps or photos are sufficiently detailed to allow the Department to discern any of the biological or physical indicators typically used to determine an OHWM. The best available historic information indicates the elevation of the water levels and location of the water's edge on the shoreline when each elevation was measured or each map was created, or shows where the shoreline was "meandered" in the original 1835 government survey.

As clearly documented, Lake Michigan water levels have varied greatly since the time of statehood. The Department examined and roughly correlated Lake Michigan estimated and measured water levels to key dates when shoreline maps were also available. The reconstructed and recorded Lake Michigan water levels show higher water levels during the original government survey in 1835; lower than average water levels at statehood (1848); higher than normal water levels when the 1873, 1885, and 1888 plat maps were created; lower than average water levels during the 1930s, and higher levels in 1943-56 when the 1955 bulkhead was established (*Table 2*). None of the information provided explained why the Bay View plat maps from 1873, 1885, and 1888 platted lots waterward of the mapped shoreline; perhaps the lower water levels in previous decades caused the surveyor to plat out into the water expecting those lands to be exposed again in the future.

Table 2, General water level conditions on Lake Michigan associated with key shoreline mapping time periods. Water level information from Great Lakes Water Level Dashboard (Joeseph P. Smith, 2015) *and Quinn & Sellinger* (2006)

Time Period	General Water Level Patterns
Original Government Survey (1835 - 1839)	Higher than average
Statehood Charter (1840 - 1851)	Lower than average
Initial plat maps (1860 - 1895)	Higher than average
Navigation maps (1923 – 1942)	Lower than average
Bulkhead Line (1943 – 1956)	Higher than average

The relationship between a meander line or a mapped shoreline and the OHWM is highly variable and depends on many factors including the shoreline slope, height and duration of fluctuating water levels, fetch and wind action of waves, and type of material composing the shore. Parcel 92 is in an area somewhat protected from wind that probably would not have experienced as much wave action as exposed sites, so the OHWM likely would not be

located as far landward of the static, average water levels or mapped shoreline as on other more exposed sites on the Great Lakes. Another uncertainty is that the Department could not locate any guidance or scientific literature that sets a standard minimum or average time for how long water must be present or act upon a shore to establish an OHWM. So even if the Department could determine how long water had remained at a level or location shown on a map, it is impossible to say for certain that an OHWM would have established in that period.

The Department recognizes an OHWM is normally located landward of a fairly stable water's edge or water level because wave, ice, and wind often cause the action of the water to reach higher onshore and further inland. An OHWM location can change over time by accretion or reliction, or when a water level changes naturally and stays at its new elevation and location long enough for water to create OHWM indicators of its presence or action there.

The Department has documented that the water level elevation and the water's edge have changed many times during the almost 170 years since the State became owner of the lakebed upon statehood (1848). The Department recognizes the uncertainty with assuming if or when those water level changes established new OHWMs. Ordinary High Water Mark changes could cause the State to gain lakebed and riparians to lose upland when the OHWM is higher or the State to lose lakebed and riparians to gain upland when the OHWM is lower. But if changes in the water's edge and its elevation are too short lived or not pronounced enough for the presence and action of water to leave the distinct marks on the shore needed to establish a new OHWM, the elevation and location of the OHWM would not change.

The Department also considered the location of the shoreline in 1892 when owners of the land that is now Parcel 92 purportedly began filling large areas of Parcel 92 without State permission or approval. If some areas of lakebed on what is now Parcel 92 had become upland due to lower lake levels or accretion and a new OHWM had established between 1848-1892, the riparian owner would have taken title to any newly created upland and could have legally placed fill on its upland. The Department cannot determine whether this did or did not happen, since the recorded water levels since 1860 are the only definitive information available.

The Department recognizes there is a high level of uncertainty in delineating an OHWM by relying on a shoreline mapped on the date a historic map was created or on a meander line surveyed and recorded on a date(s) when government surveyors walked section lines and placed posts where the lines met the water's edge. Mapped shorelines and surveyed meander lines record conditions on one or several days, not over a period long enough to create the physical indicators of an OHWM.

Uncertainty Exists Related to the Extent of Fill and Accretion on Parcel 92

Extensive historic information in the hearing record confirms substantial fill was placed on the area of Parcel 92. But newspaper accounts of the fill material placed are not descriptive enough to determine if such fill was placed above or below an established OHWM, in areas of open water, or atop naturally accreted areas of shorelines, especially in areas directly adjacent to the dock structures where sediment may have been more prone to settle. The extent of accreted land on Parcel 92 is not well documented. Unless specifically studied, accretion is not an easily quantified process, and accretion is typically not documented by photos or newspaper articles focused on human activities. The record contains considerable uncertainty describing the extent of the lacustrine/alluvial soil layer and whether fill was deposited on accreted lands.

The Ayres report (Ayres, 2015b) noted that in some cases native material may have been used as fill. Ayres (2015a) soil borings show a lacustrine soil layer under the entirety of Parcel 92, even landward of the earliest dated shorelines. Soil boring WMW-6 shows lacustrine deposits at 3 feet below ground surface (*Figure* 6) yet WMW-6 is located landward of the earliest historic mapped shorelines (*Figure* 7). There is some uncertainty as to whether Ayres assumed all native materials below the fill layers were lacustrine in nature, especially compared to other reports that designated layers as alluvial based upon the presence of shell fragments. The soil borings are designed to describe differences in soil layers, but shed no light on the mechanism that formed those layers. Shell

fragment or native material could have been accreted at the water's edge by natural processes (STS, 2005). Lacustrine and alluvial layers could have been glacially derived sediment (glacial till), high water events, and wind action or erosion from another location. As noted by Wilcox et al. (2007), the Great Lakes are rimmed by coastal sedimentary deposits and it is not surprising that lacustrine or alluvial layers are found throughout this area. Uncertainty exists as to when these native materials were deposited and whether the layers were beneath open water, accreted land, or fill material when Wisconsin became a state.

The Meander Line as the Starting Point for the OHWM

At other locations on the Great Lakes with substantial fill (e.g., Superior Harbor), the Department typically uses the meander line as the starting point for its OHWM determination when the original government surveys accurately mapped the meander line or shoreline (LaValley, 2017). Based upon information on the BCPL website (BCPL, 2018), surveyors walked the section lines and placed a post where the section line intercepted the waterbody. At this site, if the surveyor walked the north line of section seven, walking east to the west shore of Sturgeon Bay, he would have traveled about ¼ mile. If the surveyor walked the east line of section seven, walking north to the west shoreline of Sturgeon Bay, he would have traveled about another ¼ mile. If these were the only 2 meander points established, and the surveyor drew a straight meander line between them, the distance of the meander line between the two points would about one mile apart. But since the shore and the meander line are mapped as having a definite bump or curve between those two points, the surveyor must have travelled along the shore at least part of the way. In the surveyor's notes recorded in April-May 1835 (BCPL, 2018), a total of four posts on the left (west) bank in the vicinity were set, leading the Department to conclude that the 1835 survey map is a relatively accurate estimate of the shoreline at that time. This line would be the Department's typical starting point for an OHWM where no physical or biological indicators are present.

At the time of the original government survey in 1835 and for several years thereafter, higher water levels were estimated or measured, so the water's edge and meander line would have been further landward than compared to the period between 1840-1851, when lower water levels were shown. For a period of 8 years before statehood in 1848, water levels were lower than they had been in 1835 when the meander line was established. The water level appears to have decreased approximately 1-3 feet between 1835 and 1848, so by statehood in 1848 the OHWM could have established further waterward of the 1835 meander line.

Mapped shorelines in 1873 and 1885 (*Figure* 8) and water levels were used to estimate historic shoreline slopes and account for documented lower water levels at statehood in 1848. *(Table 3)* The Department averaged the historic shoreline slopes (Col. 4) and averaged the measured May-October water elevations (Col. 1) to reasonably estimate the location of the 1848 shoreline (Col 2) in reference to the 1835 surveyed meander line.

The Department averaged the measured water level elevations for 1873 and 1885 (Col. 1) using data from the May-October open water seasons and used the estimated paleo-water elevations in 1835 and 1848 (Col. 1) (Smith, et al., 2015 and Quinn, 2006). The average distances between the 1835 surveyed meander line and the shorelines on the 1873 and 1885 plat maps were measured in feet (Col. 2) and used to calculate an average shoreline slope from meander line to plat map shoreline for each year (Co. 4) with the equation:

> *Shoreline Slope (Col. 4) = horizontal distance in feet of 1835 meander line to mapped shoreline (Col. 2) divided by vertical change in water depth in feet (Col. 3).*

The average calculated 1873 shoreline slope was 61.86 feet horizontal to 1 foot vertical (61.86H:1V) and the average calculated 1885 shoreline slope was 31.60 feet horizontal to 1 foot vertical (31.60H:1V) (Col. 4). Using the same equation, the Department applied both the 1873 and the 1885 shoreline slopes to determine a range of 85 to 166 feet for the 1848 shoreline distance from the 1835 meander line (Figure 9). The Department averaged the 1873 and 1885 shoreline slopes and selected the average shoreline slope of 46.73H:1V as a reasonable approach to determine the 1848 shoreline at 125 feet waterward of the 1835 meander line (Figure 9).

Table 3. Table used to estimate the shoreline slope and location of the 1848 shoreline.

	Column 1	Column 2	Column 3	Column 4
YEAR	Average Water Level (feet)	Average Distance from Meander Line (feet)	Change in Water Depth from 1835 (feet)	Shoreline Slope (Col. 2/Col. 3) (H: 1V feet)
1835	578.81[1]	0	0	0
1873	580.96 [2]	133 LANDWARD	+2.15	61.86:1
1885	582.07 [2]	103 LANDWARD	+3.26	31.60:1
1848	576.13[1]	-125[4] WATERWARD	-2.68	46.73:1 [3]

(1) Based upon paleo-record data set from Quinn and Sellinger (2006)
(2) Average water depths for May - October of each year (Smith et al., 2015)
(3) Average shoreline slope from the 1873 and 1885 calculated slopes
(4) *Calculated based upon the average shoreline slope and water depth change. Negative value indicates the line is waterward of the meander line.*

The Department notes an unexplained discrepancy in the fact that the 1885 average May-Oct. water level was 1.11 ft. higher than the 1873 average May-Oct. water level. The plat maps show the shoreline to be landward of the 1835 meander line, but since the average May-Oct. water level was higher in 1885 than in 1873, the 1885 plat map shoreline generally should have reached and been mapped farther landward than the 1873 plat map shoreline. The discrepancy may be related to different approaches of surveyors used to map shorelines or non-linear relationships between shoreline locations and the recorded water levels. Or since the shoreline shown on a map is a snapshot of where the water was on a specific day, perhaps the water was unusually high the day that the 1873 mapping data was surveyed or unusually low on the day that the 1885 mapping data was surveyed. The Department also used the average open water period of May-October to represent the timeframe of each survey, so it's possible the mapping data was surveyed during another season or that the years 1873 and/or 1885 had some days of extreme highs or lows which "flatten out" when calculating a monthly average elevation. This discrepancy corroborates the uncertainty of using shorelines and lake levels to determine the shoreline slope and OHWM; however, these are the only data the Department found available to account for the estimated lower lake levels at the time of statehood in 1848.

Accounting for Accretion at Parcel 92

In 2014, at the request of the City's attorney, the Department reviewed the "Plat of Survey" for Parcel 100 depicting the approximate location of the OHWM. Department staff reviewed the 1925 U.S. War Department map (*Figure* 10) and wrote in the Concurrence:

> *…the Parcel 100 was not dry land but was actually under the waters of Sturgeon Bay. The 1925 Map illustrates that the Parcel was bookended by an abutment labeled L.M. Washington Dock and designated as Mill Refuse on the southeastern side and a dock structure labeled Teweles & Brandeis on the northwestern side. The Parcel area between the two solid structures in the 1925 Map appears to have been a shallow bay of 2 ft. water depth. In my opinion, the Parcel area would have filled with sediment slowly over the course of time between the 1925 Map and the 1955 Bulkhead Map. The gradual addition of soil to the shallow area shown in the 1925 Map should be considered accretion and would extend the riparian title out to the OHWM.*

In March 2017, Judge Huber found the portion of Parcel 100 lying waterward of the OHWM and described in the Department's Concurrence is owned by the State in trust for the benefit of the public under the public trust

doctrine. Judge Huber accepted the Department's conclusion that accretion occurred on Parcel 100. In comparing the 1925 map with the U.S. Department of War map from 1942 (*Figure* 11), portions of the southwest corner on the boundary between Parcel 92 and Parcel 100 appear to be irregularly filled in, consistent with natural accretion. The Department recognizes the eastern, waterward end of the pier and the north side of the pier have been expanded, but note little change in the open water dimensions along the southeast side of the pier and that natural accretion would not have artificially ceased at the Parcel 100/Parcel 92 lot line, but also occurred along the entire southern side of pier structure.

Decision Summary

The Department has determined that there is significant uncertainty in concluding that any historical mapped shoreline represents a true OHWM. The Department has determined there is also uncertainty associated with the issues of whether material found in the borings at the site should be classified as fill or native materials, and whether fill was placed on top of accreted lands or directly on lakebed.

Without the presence of physical and biological indicators to indicate the location of the OHWM, the OHWM delineation narrows to the question of what portion of Parcel 92 was lakebed – and thus came into state ownership subject to the public trust - at the time of the statehood charter in 1848. Absent a showing that after statehood, accretion occurred or water levels lowered or raised and remained lower or higher long enough for new OHWM indicators to establish, the default boundary for lakebed is the boundary established when the state first gained title to lakebed at statehood in 1848. The Department believes that the 1835 meander line - established by surveyors with "boots on the ground" in the most literal sense – is the closest starting point for the water's edge and by default, the starting point for the OHWM in 1835. The Department concluded that the 1835 meander line was likely close to the actual water's edge when the survey was undertaken based on the surveyor's instructions to place a post where the section line intersected with the water's edge, the surveyor's notes showing he set a total of four posts on the left (west) bank in the vicinity Parcel 92, and the curved meander line shown on the surveyed mapped area. A meander line set simply as a line between 2 posts would not have been curved, indicating the surveyors actually observed at least part of this shoreline.

The Department has used the 1835 mapped meander line as the starting point for the OHWM in 1835 and adjusted the final OHWM in this ruling based upon the estimated water level at the time of statehood (1848) and accounted for accretion along the southeast side of the pier as described in the Concurrence findings for Parcel 100. Based upon the uncertainty associated with (a) fluctuating water levels and shoreline maps and their uncertain relationship to the OHWM and (b) fill placement, the Department concludes that at the time of statehood the OHWM would have been established 125 feet waterward of the 1835 meander line due to estimated lower water levels over several years prior to 1848. The Department also concludes a reasonable location of the OHWM assumes natural accretion did not cease at the Parcel 100/Parcel 92 lot line, but also occurred along the entire southern side of Parcel 92.

The Department determines the OHWM at Parcel 92 as:

> *a line commencing at the Parcel 100 lot line, running north, from the west end of the DNR Concurrence OHWM boundary on Parcel 100 to the eastern edge of the former Harris Dock mapped by the 1925 Army Corps of Engineers navigation map, then continuing southwest along the edge of the dock to a point 125 feet waterward of the 1835 meander line identified on the original government survey and then running parallel to the meander line in a northwesterly direction to the Parcel 92 property line (Figure 12).*

The Department recognizes the great amount of public and private resources that have been expended on the delineation of the OHWM at Parcel 92 and has strived to make a reasonable decision that protects the constitutionally based public interests in the navigable water of Sturgeon Bay while also considering the interests of the City of Sturgeon Bay as a riparian owner.

FINDINGS OF FACTS

1) The OHWM is the boundary between riparian owned uplands and the publicly owned beds of natural lakes. It is the boundary of public rights and interest in the waters of navigable streams and lakes. When the water's edge is waterward of the OHWM a riparian owner has a qualified right to exclusively use the land between the actual water's edge and the OHWM.

2) The first definition of the ordinary high water mark (OHWM) is found in *Lawrence v. American Writing Paper Co*., 144 Wis. 556,562 (1911): "… ordinary high water mark. That is the point up to which the presence and action of water is so continuous as to leave a distinct mark by erosion, destruction of vegetation or other easily recognized characteristics."

3) Three years later the Supreme Court clarified and expanded the definition of OHWM in *Diana Shooting Club v. Husting*, 156 Wis. 261, 272 (1914): "By ordinary high-water mark is meant the point on the bank or shore up to which the presence and action of the water is so continuous as to leave a distinct mark either by erosion, destruction of terrestrial vegetation, or other easily recognized characteristic."

4) The *Diana* court also stated, "And where the bank or shore at any particular place is of such character that it is impossible or difficult to ascertain where the point of ordinary high-water mark is, recourse may be had to other places on the bank or shore of the same stream or lake to determine whether a given stage of water is above or below the ordinary high-water mark."

5) Wisconsin common law establishes that the boundaries of navigable waters and their beds are determined based on the location of the OHWM at the time of statehood. See *Diana Shooting Club v. Husting,* 156 Wis. 261and *Illinois Steel Co. v. Bilot*, 109 Wis. 418, 425(1901) ("title to the beds of all lakes and ponds, and of rivers navigable in fact as well, up to the line of ordinary high-water mark, within the boundaries of the state, became vested in it at the instant of its admission into the Union, in trust to hold the same so as to preserve to the people forever ... ").

6) Among other incidents of riparian ownership, and to preserve the riparian's access to the water, is the right to the land formed by gradual and natural accretions and uncovered by reliction. *Doemel v. Jantz* 180 Wis. 225 (1923), *Attorney General Ex Rel. Bay Boom Wild Rice and Fur Co.,* 172 Wis. 363 (1920), and *Baldwin v. Anderson,* 40 Wis. 2d 33 (1968). This is true even though the riparian does not have title to the bed of a meandered lake. *Roberts v. Rust,* 104 Wis. 619 (1899) and *Boorman v. Sunnuchs,* 42 Wis. 223 (1877).

7) The Courts have held that land waterward of the OHWM is land subject to the public trust doctrine and restricted to uses compatible to the public trust or associated with navigation, except as noted in the case of natural accretion. Wisconsin law holds that the filling of submerged lands does not transfer title to the riparian property owner. See *Menomonee River Lumber Co. v. Seidl*, 149 Wis. 316, 320-321 (1912) ("One cannot by building up land or erecting structures in a lake, the title to the bed of which is

in the state, thereby extend his possession into the lake and acquire the state's title."). The possession of a deed or federal patent purporting to convey title to lakebed is meaningless for that purpose. *Illinois Steel Co. v. Bilot*, 109 Wis. 418 (1901).

8) Parcel 92 is described as being a part of Lot One (1), Block Nine (9), according to the recorded Plat of Harris First Addition and also a part of Lots One (1), Six (6) and Seven (7), Block Eight (8) of Bay View Plat, and all of Lots Two (2), Three (3), Four (4) and Five (5), Block Eight (8), of Bayview Plat, and part of Subdivision 76, all in the Northeast Quarter (NE1/4), Section Seven (7), Township Twenty-seven (27) North, Range Twenty-six (26) East, in the City of Sturgeon Bay, Door County, Wisconsin described as follows:

Commencing at the intersection point of the East line of Neenah Avenue and the North line of Maple Street; thence North 89 deg. 59 min. 38 sec. West, 91.92 feet along the North line of Maple Street to the point of beginning of lands to be described; thence North 13 deg. 34 min. 55 sec. East, 47.11 feet; thence North 33 deg. 52 min. 22 sec. East, 263 feet; thence North 47 deg. 16 min. 59 sec. West, 200.38 feet; thence South 42 deg. 16 min. 00 sec. West, 229.08 feet; thence South 40 deg. 01 min. 00 sec. West, 33.71 feet; thence South 32 deg. 53 min. 44 sec. West, 33.77 feet; thence West 92.01 feet; thence South 06 deg. 01 min. sec. East, 178.01 feet to the North line of Maple Street; thence South 89 deg. 59 min. 38 sec. East, 256.57 feet along said North line to the point of beginning.

9) Parcel 92 has the physical address of 92 East Maple Street, Sturgeon Bay, WI 54235 and Tax Parcel Number 281-12-10080101. The City of Sturgeon Bay obtained title to Parcel 92 in 2012 by a special warranty deed from Freedom Bank.

10) The Department has not made an Ordinary High Water Mark determination on Parcel 92 before issuing this ruling.

11) In March 2017, the Door County Circuit Court enjoined the City from making any conveyance of Parcel 92 to a private party (*Friends of the Sturgeon Bay Public Waterfront v. City of Sturgeon Bay*, No. 1 6-CV -23). The Judgment provides that the scope of the injunction is subject to modification following a declaratory ruling by the Wisconsin DNR determining the location of the OWHM for Parcel 92.

12) The City claims title to the parcel of real property located at 100 East Maple Street in the City of Sturgeon Bay formerly known as Tax Parcel No. 281-2415090101, consisting of parts of Document Nos. 318850 and 783268, excepting part of Document No. 580907 ("Parcel 100"). A portion of Parcel 100 is more particularly described as: A parcel of land located ln the NE 1/4 of Section 7, T. 27 N., R. 26 E., City of Sturgeon Bay, Door County, Wisconsin, bounded and described as follows:

Commencing at the intersection point of the east line of Neenah Avenue and the north line of Maple Street, thence N. 89°39'38" W., 91.60 feet along the north line of Maple Street to the point of beginning of lands to be described; thence N85°03'44" E.-- 49.68 feet; thence N69°31'57"E -- 80,99 feet; thence N46°00'22"E -- 64.41 feet to the approximate ordinary high water mark of Sturgeon Bay as determined by the Wisconsin Department of Natural Resources; thence along said ordinary high water mark as follows: N69°57'18"W-- 16.60 feet; thence N54.0l'08"W -- 52.88 feet; thence N46°47'03"W -- 11.34 feet; thence N37"S9'31 "W -- 5.05 feet; thence N24°15'51"W -- 7.57 feet; thence N 01°14'01"W -- 11.87 feet; thence N ll°54'30" E -14.79 feet; thence N 19°09'16"E --35.48 feet; thence N27°35'00"E -- 30.30 feet; thence leaving said ordinary high water mark S33°52'22"W -- 209.15 feet; thence S l3°'34'55"W -- 47.11 feet to the aforementioned north line of Maple Street; thence S89°59'38" E -- 0.32 feet along said north line to the point of beginning.

13) The Department issued a "WDNR Determination of Concurrence with The Approximate Ordinary High Water Mark for the City of Sturgeon Bay West Side Waterfront Project," recorded in the office of the Door County Register of Deeds on October 28, 2014, as Document No. 782928 (the "Concurrence"). The determination concurs in the location of the OHWM for Parcel 100. The portion of Parcel 100 lying landward of the OHWM as found in the Concurrence is owned by the City of Sturgeon Bay. The portion of Parcel 100 lying waterward of the OHWM as found in the Concurrence is owned by the State in trust for the benefit of the public under the public trust doctrine, Wis. Const., Art. IX, sec. 1, and may not be conveyed to a private party.

14) The Department is precluded from following the standard methodology of examining biological and physical indicators on Parcel 92 to establish an OHWM for that location. Because such indicators do not exist in this case, the Department has considered historic documents, maps, water levels, soil borings, and all public testimony presented at the hearing and in the record of the Door County Circuit Court case incorporated as part of this hearing.

15) The Department finds there is significant uncertainty associated with using any historically mapped shoreline as the OHWM due to the large variation in Lake Michigan water levels, the variation in shoreline slopes, and the mapped shoreline's relationship to an OHWM.

16) The Department finds there is significant uncertainty as to whether fill occurred on accreted land or lake bed on Parcel 92 and to what extent the described lacustrine or alluvial soil layer extends beneath fill in the area of Parcel 92.

17) The Department determines the location of the OHWM in each specific case and on each specific site based upon the facts and information available for that site and case. The approach the Department used to determine the OHWM on Parcel 92 is based on the unique facts and information for Parcel 92 and may not be applicable to other parcels or cases on the Great Lakes or other water bodies.

CONCLUSIONS OF LAW

1) The public trust doctrine applies with equal force to filled lakebeds even if, because of fill, the area is no longer a navigable waterway. See *State v. Trudeau*, 139 Wis. 2d 91 (1987) ("An area need not be navigable to be lakebed. If the land is part of the navigable lake, then the fact that the specific area cannot be navigated is irrelevant to the state's claim."); *State of Wisconsin v. Public Service Commission*, 275 Wis. 112, 117-19 (1957).

2) Filling of lakebed below the OHWM does not change the character of those formerly submerged lands as constitutionally protected trust property. *Diedrich v. Northwestern Union R. Co.*, 42 Wis. 248 (1877).

3) DNR is responsible under s. 30.10(4)(b), Stats., for determining the extent of public lakebed on Parcel 92 in conformity with the common law. Determining the extent of public lakebed requires DNR to determine the location of the ordinary high water mark that represents the landward boundary or lateral extent of the public lakebed.

DEPARTMENT OF NATURAL RESOURCES RULING

The Department hereby rules that the Ordinary High Water Mark (OHWM) at Parcel 92 in the City of Sturgeon Bay and adjacent to Sturgeon Bay, Lake Michigan is described as:

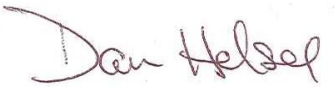
The Department determines the OHWM at Parcel 92 as a line commencing at the Parcel 100 lot line, running north from the west end of the DNR Concurrence OHWM boundary on Parcel 100 to the eastern edge of the former Harris Dock mapped by the 1925 Army Corps of Engineers navigation map, then continuing southwest along the edge of the dock to a point 125 feet waterward of the 1835 meander line identified on the original government survey and then running parallel to the meander line in a northwesterly direction to the Parcel 92 property line as shown in Figure 12.

1) The Department herby rules that the area of Parcel 92 landward of the OHWM described above is private riparian land.

2) The Department hereby rules that the area of Parcel 92 waterward of the OHWM described above is owned by the State in trust for the benefits of the public under the public trust doctrine, Wis. Const., Art. IX, Sec. 1, may not be conveyed to a private party, and may be used only for purposes compatible with the public trust doctrine.

Dated at Black River Falls, Wisconsin, February 5, 2018

STATE OF WISCONSIN, DEPARTMENT OF NATURAL RESOURCES

By 

DANIEL R. HELSEL, HEARING OFFICER
FIELD INTEGRATION LEADER
OFFICE OF THE SECRETARY

NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision, you should know that Wisconsin Statutes and Wisconsin Administrative Code establish time periods within which requests to review Department decisions must be filed.

For judicial review of a decision pursuant to Sections 227.41(1), 227.52 and 227.53, Wisconsin Statutes, you have 30 days after the decision is mailed, or otherwise served by the Department, to file your petition with the appropriate court and serve the petition on the Secretary of the Department. Such a petition for judicial review shall name the Department of Natural Resources as the respondent.

FIGURES

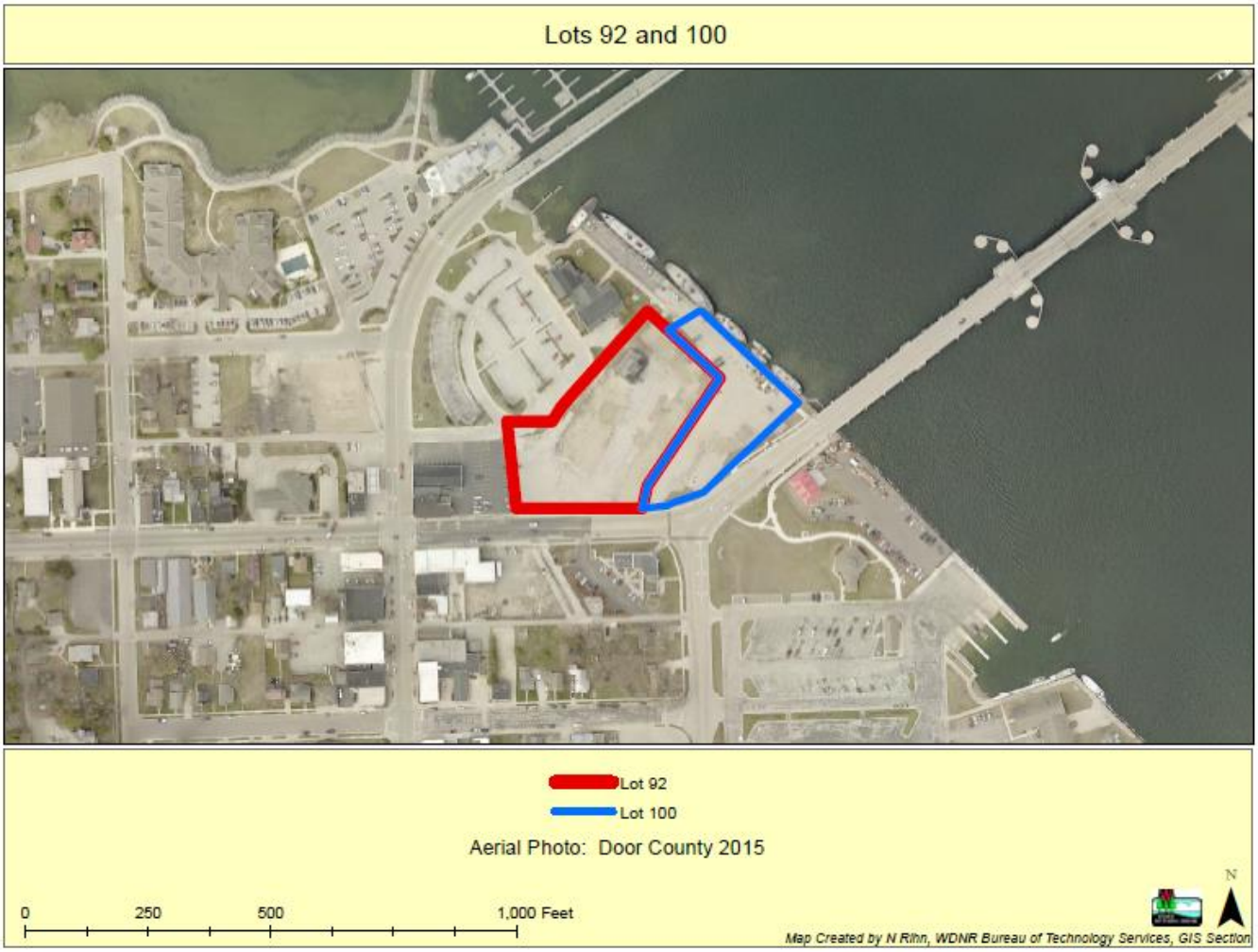


Figure 1. Site Location Map

Location of Parcel 92 and Parcel 100 in the City of Sturgeon Bay, North of Oak Street Bridge.

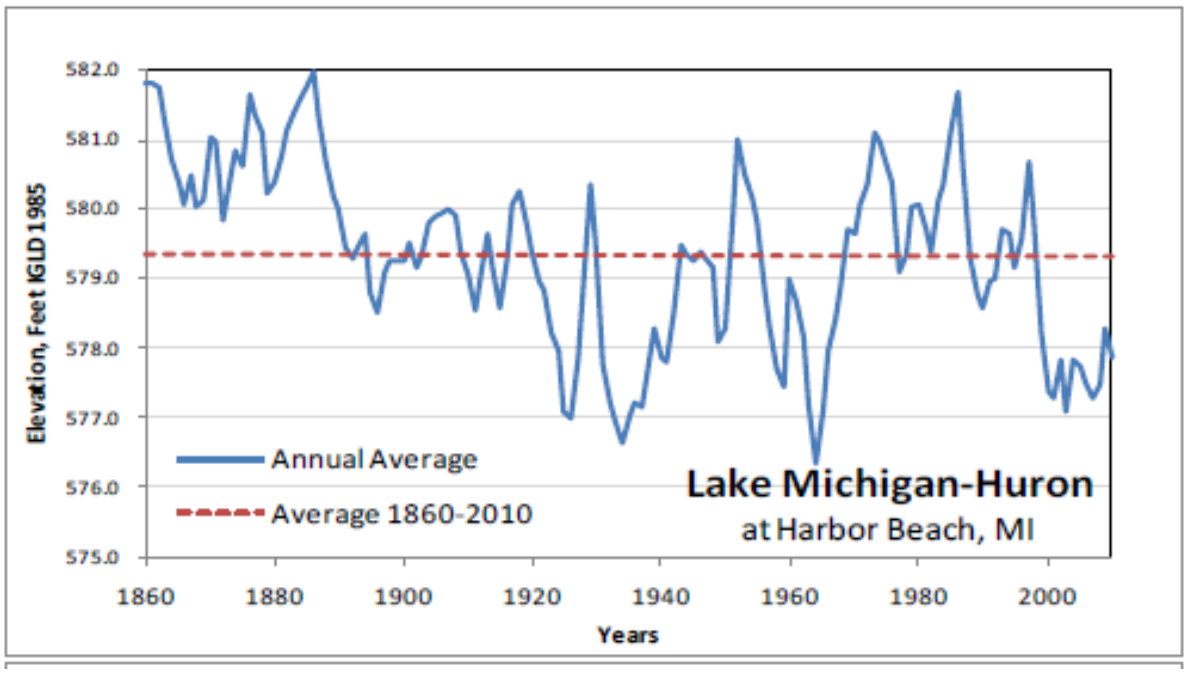


Figure 2. Lake Michigan historic water levels.

From Great Lakes Coastal Flood Study, April 2015, (FEMA, 2012)
http://greatlakescoast.org/pubs/factSheets/GLCFS_FS2_WaterLevels.pdf

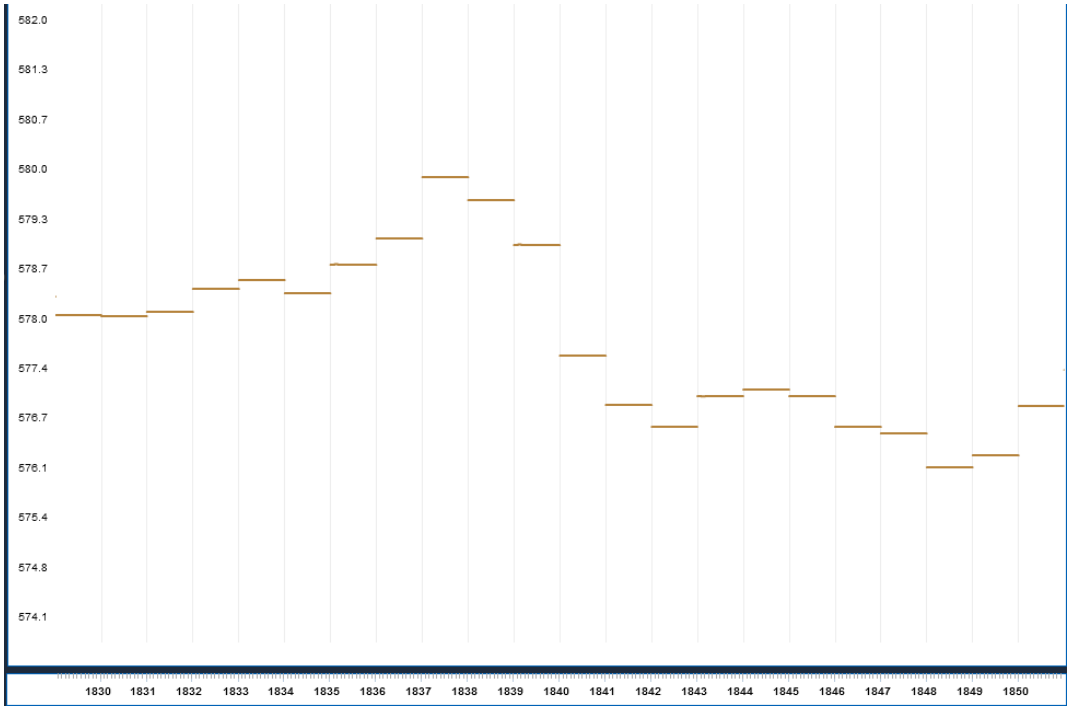


Figure 3. Paleoclimate reconstruction of Lake Michigan water levels

Paleoclimate reconstruction of Lake Michigan water levels during the period of the original governmental survey (1835) and Statehood charter in 1848. From Great Lakes Water Level Dashboard, (Joeseph P. Smith, 2015).

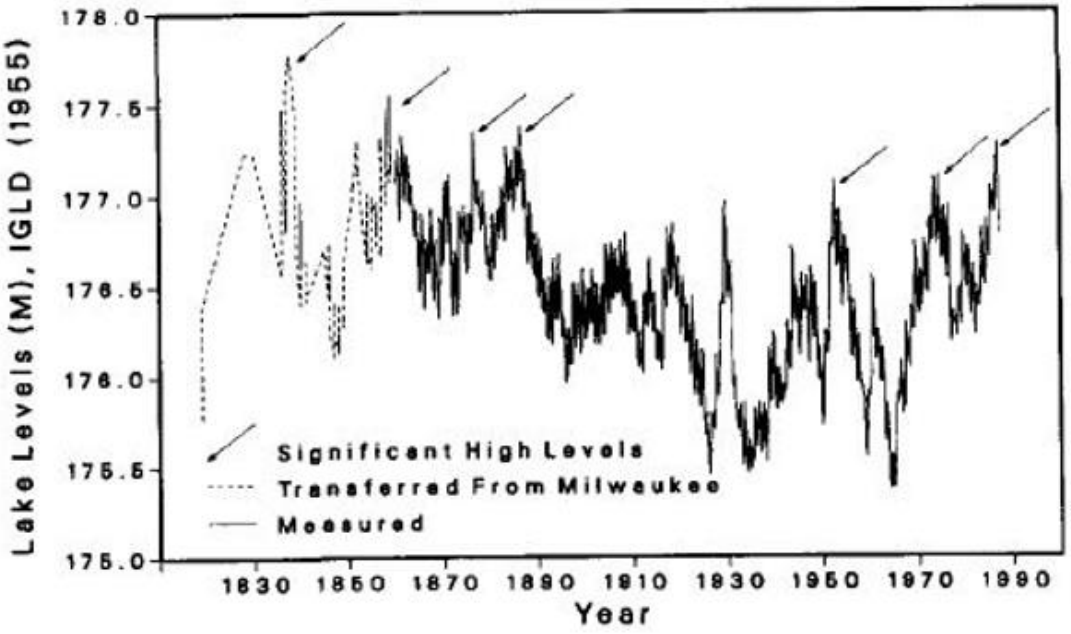


Figure 4. Lake Michigan water level elevations

Lake Michigan historic water levels for key dates from Quinn and Sellinger (1990).

Figure 5. Department Remediation and Redevelopment Sites.

Remediation and Redevelopment project sites near Parcel 92 with soil boring information collected as part of phase I or phase II site assessments. From the Bureau for Remediation and Redevelopment Tracking System (BRRTS) web page (http://dnr.wi.gov/topic/brownfields/botw.html)

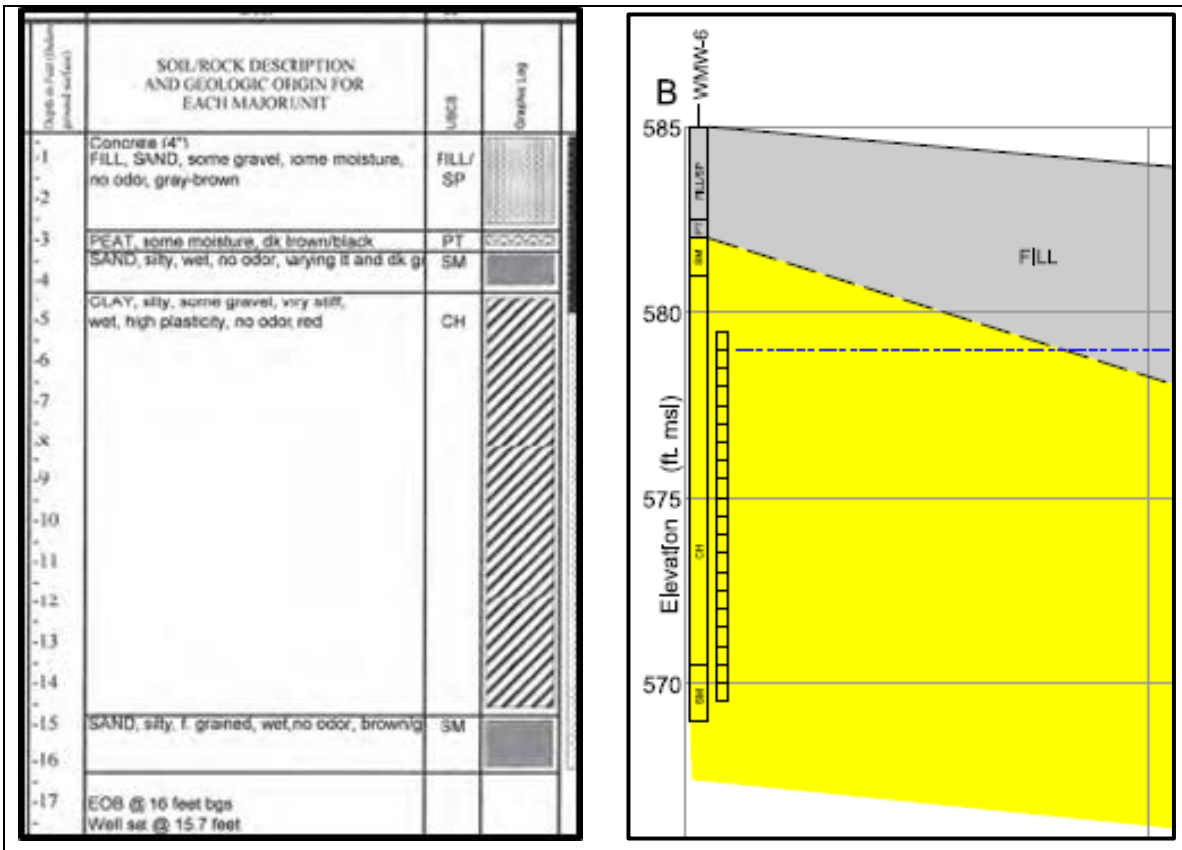


Figure 6. Soil Boring Log Information at WMW-6

Soil boring and associated cross section transect map for section A-A' from Ayres 2105a showing the lacustrine layer (in yellow) and the fill layer in gray.

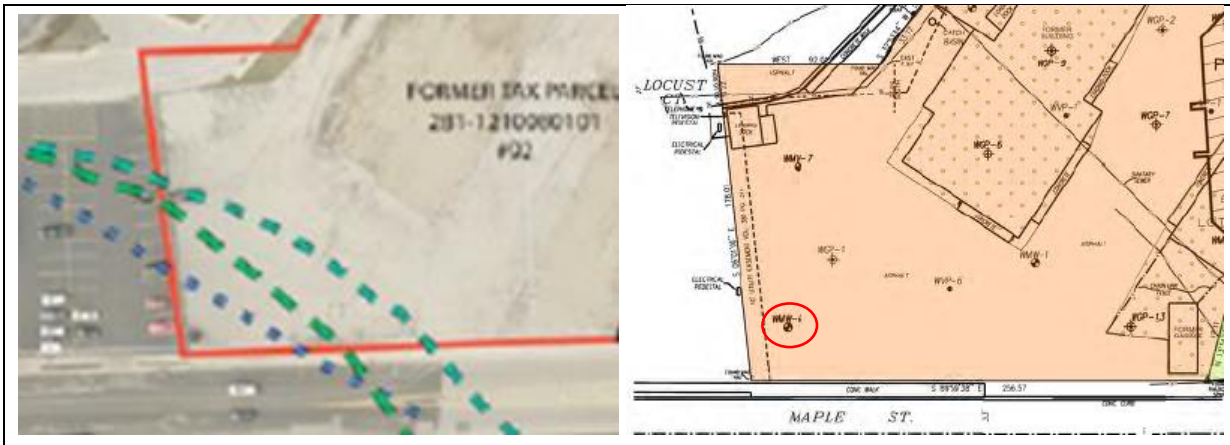


Figure 7. Late 1800s shorelines relative to the WMW-6 soil boring with a lacustrine soil layer.

Mapped shorelines shown in 1873, 1885 and 1888 plat maps relative to the location of WMW-6 (circled in red) where lacustrine soil layer was delineated.

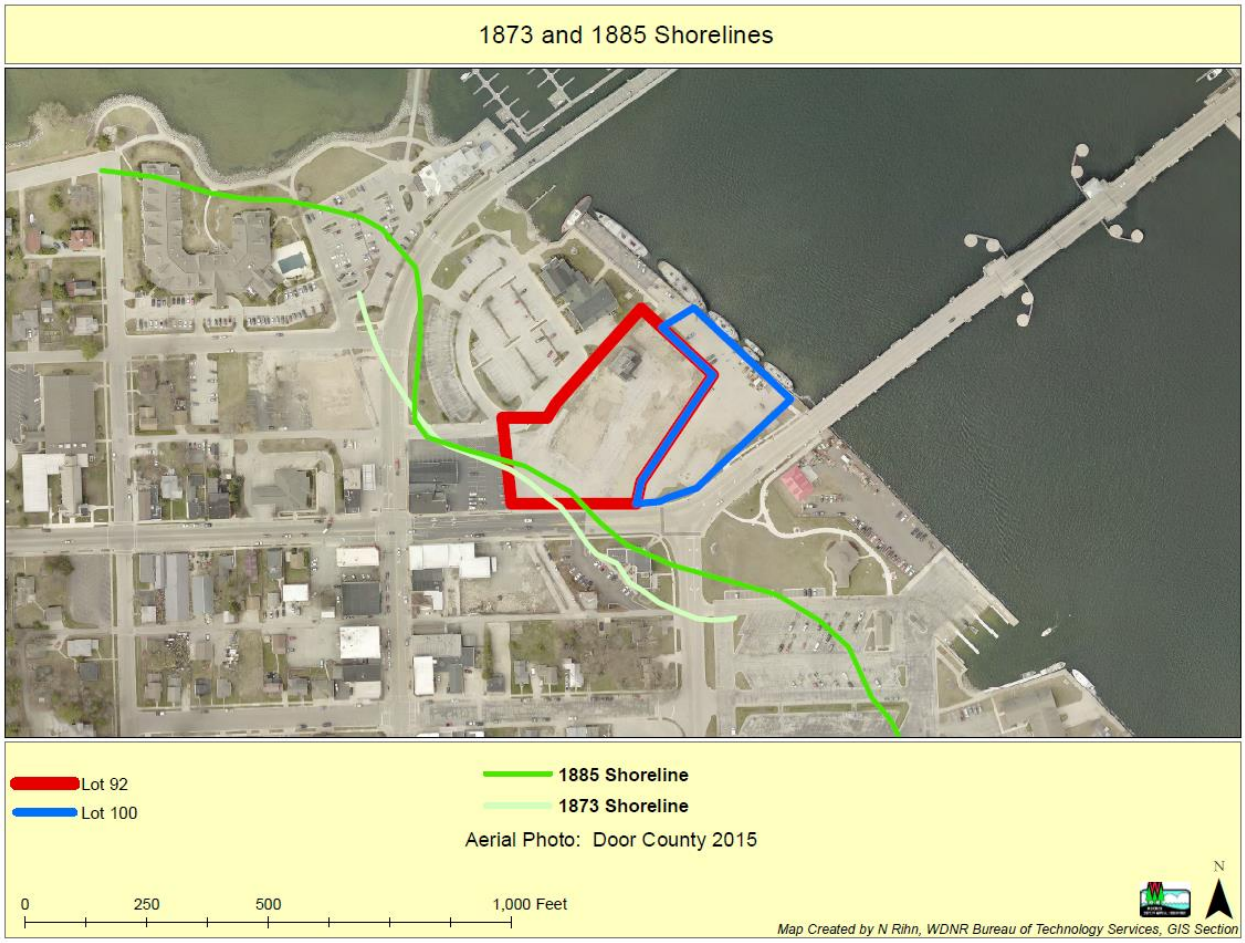


Figure 8. 1873 and 1885 mapped shorelines

The mapped shorelines from the Bay View Plats in 1873 and 1885 shown with Parcel 92 and Parcel 100.

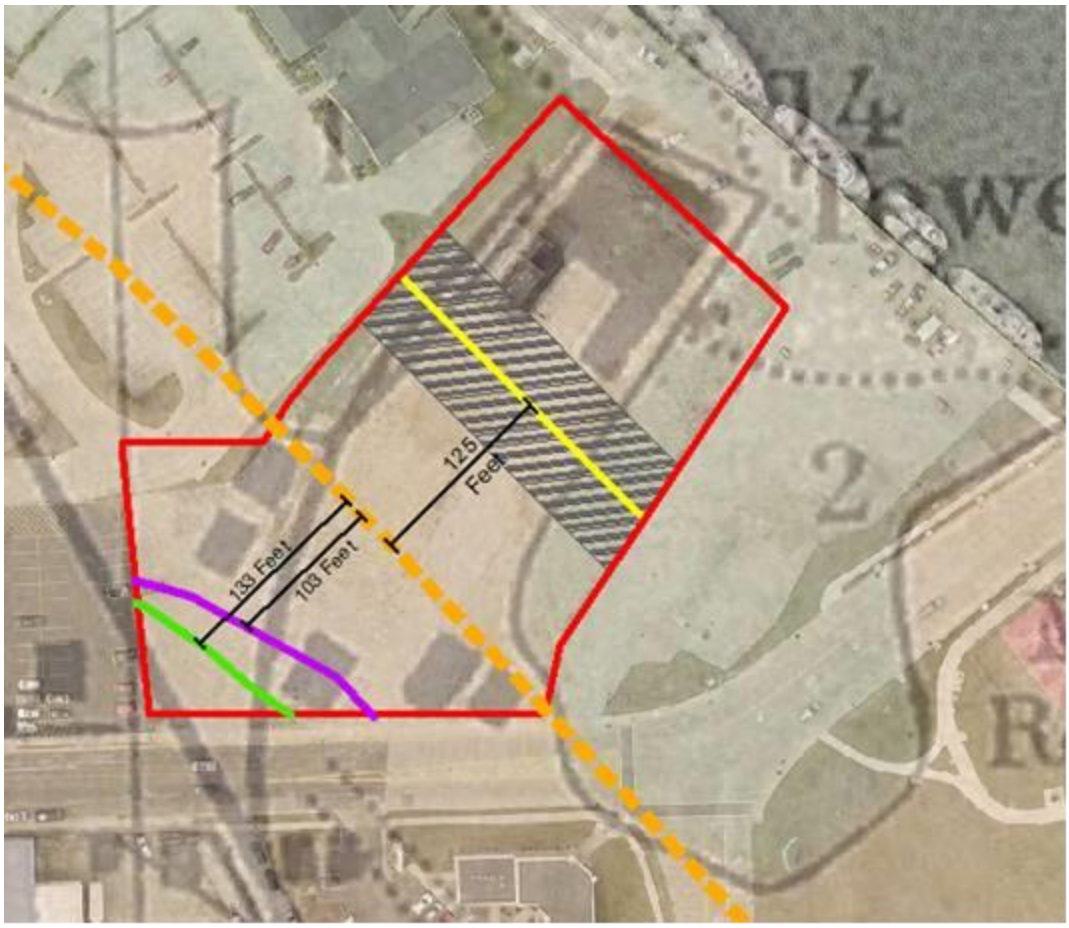


Figure 9. Distance measurements used to estimate shoreline slopes.

This figure shows the average distance from the 1835 meander line to historic mapped shorelines and the estimated location of the 1848 shoreline at 125 feet within the range of 85 to 166 feet based on the shoreline slopes calculated for 1873 (green) and 1885 (purple). Map created by WDNR GIS Section, Bureau of Technology Services, Division of Internal Services.

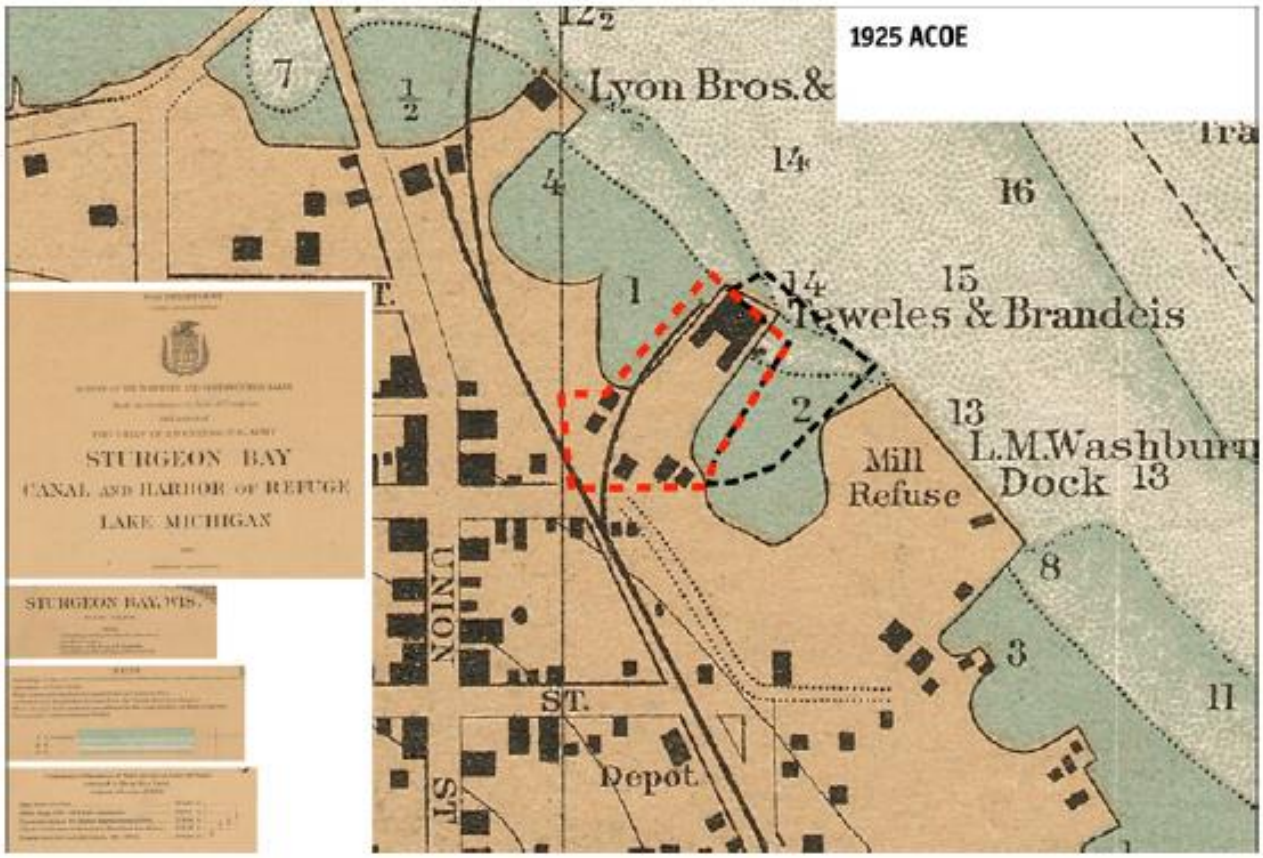


Figure 10. 1925 U.S. War Department navigation map.

U.S. War Department navigation map from 1925 showing open water along the existing dock and pier structure and portions located on Parcel 92 (red) adjacent to Parcel 100 (black) from information submitted at the public hearing.

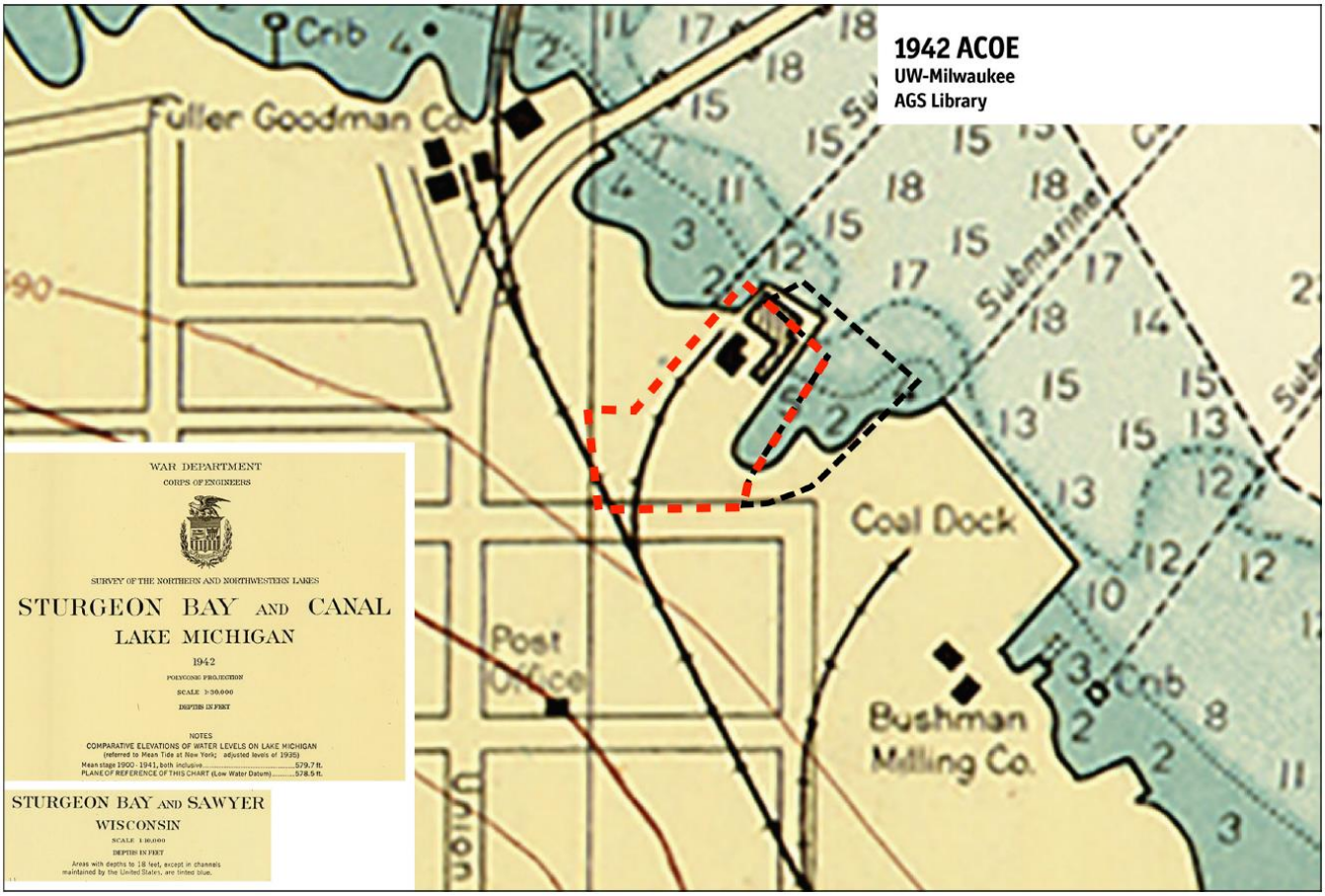


Figure 11. 1942 U.S. War Department navigation map.

U.S. War Department navigation map showing open water along the southeast shoreline of the dock on Parcel 92 (red) adjacent to Parcel 100 (black) from information submitted at the public hearing.

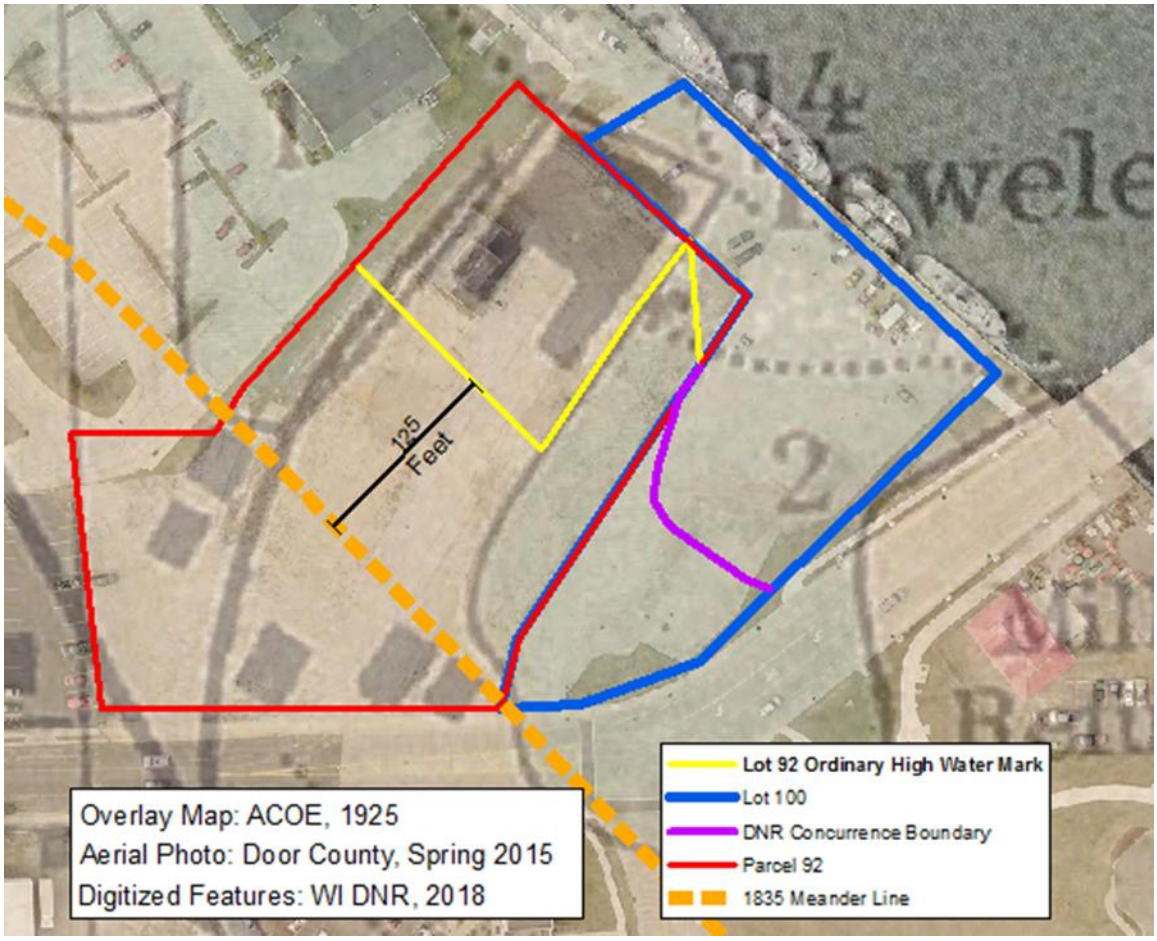


Figure 12. Location of 2018 OHWM for Parcel 92 (yellow line)

Parcel 92 in red and Parcel 100 in blue with the Concurrence OHWM in purple. The location of 1835 original meander line from governmental survey is in orange line. The 2018 Parcel 92 OHWM is ruled to be the yellow line. Map created by WDNR GIS Section, Bureau of Technology Services, Division of Internal Services.

REFERENCES

Ayres. (2015a). *NR 716 Investigation Report Addendum, West Waterfront Redevelopment, 92 and 100 East Maple Street, Sturgeon Bay, WI.* . Madison, WI: Ayres & Associates.

Ayres. (2015b). *Remedy Implementation Work Plan Soil and Groundwater Remediation, West Waterfront Redevelopment Project, 92 and 100 East Maple Street, Sturgeon Bay, WI.* Madison, WI: Ayres & Associates.

BCPL. (2018). *Board of Commissioners of Public Lands*. Retrieved from Wisconsin Public Land Survey Records:: http://digicoll.library.wisc.edu/SurveyNotes/

Bruhn, M. (2014). *WDNR Determination of Concurrence with the approximate Ordinary High Water Mark for the City of Sturgeon Bay West Side Waterfront Project.* Madison, WI: Office of the Secretary, Wisconsin Department of Natural Resources.

FEMA. (2012). *Great Lakes Coastal Flood Study*. Retrieved from Great Lakes Water Levels: http://greatlakescoast.org/pubs/factSheets/GLCFS_FS2_WaterLevels.pdf?_sm_au_=iTV6DMRJDZ1R4WWR

GLBHHD, C. C. (1992). *IGLD 1985 - Brochure on the International Great Lakes Datum 1985.* Detroit, MI: Coordinating Council on Great Lakes Basic Hydraulic and Hydrologic Data.

Harrington, A. (1996). The "Invisible Lien": Public trust doctrine impact on real estate development in Wisconsin. *Wisconsin Lawyer 69: 10-12, 69-70. [IX,1]*.

Joeseph P. Smith, T. S. (2015). *Great Lakes Dashboard Project* . Retrieved from An expandable web-based platform for visually analyzing basin-scale hydro-climate time series data: https://www.glerl.noaa.gov/data/dashboard/GLWLD.html

LaValley, S. (2017). *Personal Communication.* Superior, WI: Water Management Specialist, Bureau of Watershed Management, Department of Natural Resources.

Lenters, J. (2001). Long-term trends in seasonal cycle of Great Lakes water levels. *Journal of Great Lakes Research 27(3): 342-353*.

Merriam-Webster. (2017, December 7). *FindLaw Legal Dictionary*. Retrieved from FindLaw: http://dictionary.findlaw.com/definition/meander-line.html

Norton, R. K., Meadows, G. A., & Meadows, L. A. (2013). The deceptively complicated “elevation ordinary high water mark” and the problem with using it on aLaurentian Great Lakes shore. *Journal of Great Lakes Research*, 527-535.

Quinn, F. H. (1990). Lake Michigan record levels or 1838, a present perspective. *Journal of Great Lakes Research 16(1):133-138*.

Quinn, F. H. (2006). A reconstruction of Lake Michigan-Huron water levels derived from tree ring chronologies for the period 1600-1961. *Journal of Great Lakes Research 32:29-39*.

STS. (1991). *Subsurface contamination assessment (and amendments letters), Door County Cooperative, Sturgeon Bay, WI.* Green Bay, WI: STS Consultants Ltd.

STS. (2005). *Phase II Subsurface Assessment and Asbestos Demolition Survey, Door County Cooperative, 92 East Maple Street, Sturgeon Bay, WI.* Green Bay, WI : STS Consultants.

WDNR. (2013). *Chapter 40 - Ordinary High-Water Mark (OHWM).* Madison, WI: Waterway and Wetland Handbook, Bureau of Watershed Management, Division of External Services, Wisconsin Department of Natural Resources.

Wilcox, D. T. (2007). *Lake-level variability and water availability in the Great Lakes.* Madison, WI: U.S. Geological Survey Circular 1311.

APPENDIX A – PUBLIC HEARING APPEARANCE SLIPS RECORDS

NAME	CITY	ST	COMMENT	ORAL STATEMENT	POSITION
Allmann, Barbara	Sturgeon Bay	WI		Yes	
Andersson, Carri	Sturgeon Bay	WI	(Friends of Sturgeon Bay Waterfront)	Yes	
Anschulz, Paul	Sturgeon Bay	WI		Yes	IO
Ateu, Nancy	Sturgeon Bay	WI	(Friends of Sturgeon Bay Waterfront)	Yes	
Avenson, Kelly	Sturgeon Bay	WI	(representing Sturgeon Bay Historical Society)	Yes	
Brooks, Laurel	Sturgeon Bay	WI		Yes	
Bultman, Robert	Baileys Harbor	WI	(representing Self) • Preserve and protect the public trust for the future – the 1873 map is the OHWM.	No	
Catarozoli, Kelly	Sturgeon Bay	WI	(representing Sturgeon Bay City Council – District 1)	Yes	
Collins, Dan	Sturgeon Bay	WI	(Friends of Sturgeon Bay Waterfront)	Yes	
Ewig, Marianne	Sturgeon Bay	WI	(Friends of Sturgeon Bay Waterfront)	Yes	
Fairchild, Shawn	Sturgeon Bay	WI	(Friends of Sturgeon Bay Waterfront)	Yes	
Finnerty, Kathleen	Sturgeon Bay	WI	(Friends of Sturgeon Bay Waterfront)	Yes	
Frix, Donald Freix	Fish Creek	WI	(Friends of Sturgeon Bay Waterfront)	Yes	
Geers, Sarah	Madison	WI	(Midwest Environmental Advocates)	Yes	
Goehelman, Elliot	Sturgeon Bay	WI		Yes	

Greene, John			(representing City of Sturgeon Bay)	Yes	
Hans, Christian	Sturgeon Bay	WI		No	
Hauser, Laurel	Sturgeon Bay	WI	(representing Self)	Yes	
Hebal, Bill	Sturgeon Bay	WI		Yes	
Herlache, Thomas L.	Sturgeon Bay	WI		Yes	
Huntoon, Lori	Brookfield	WI	(Friends of Sturgeon Bay Waterfront)	Yes	
Kellems, Chris	Sturgeon Bay	WI	(representing Self)	Yes	AIMA
Livingston, Jan	Sturgeon Bay	WI		No	AIMA
Logerquist, Deborah	Sturgeon Bay	WI		No	
Logerquist, Deborah (2)	Sturgeon Bay	WI	Please email the DNR's ruling (IS-ruling that OHWM should be declared to be the 1873 determined OHWM)	No	IS
Malenius, Miriam	Sturgeon Bay	WI		No	
Morkin, Claire	Sturgeon Bay	WI	(Friends of Sturgeon Bay Waterfront)	Yes	
Nesbitt, Randall	Sturgeon Bay	WI	(representing City of Sturgeon Bay)	Yes	AIMA
Olejniczak, Marty	Sturgeon Bay	WI	(representing City of Sturgeon Bay (Comm. Dev. & Waterfront Dev.)	Yes	
Orlock, Mike	Sturgeon Bay	WI	(representing Self)	Yes	
Schabach, Ryan	Hilbert	WI	Protect our waterfront. (Small business representative)	No	
Smith, Larry	Sturgeon Bay	WI		Yes	AIMA

Urban, Robin	Sturgeon Bay	WI	No jurisdiction by the DNR in this hearing	Yes	AIMA
Van Lieshout, Josh	Sturgeon Bay	WI	(representing City of Sturgeon Bay)	No	AIMA
Ward, David J.	Sturgeon Bay	WI	I would like the ruling emailed to be at the above email address. The DNR decision needs to be considered the effect of the St. Lawrence Seaway, built in the 1950s. Subsequent dredging of the St. Clair River lowered (permanently) the level of Lake Michigan/Huron by 10-12 inches-thus altering the historic OHWM.	No	
Weber, Christie	Sturgeon Bay	WI	(Friends of the Public Waterfront)	Yes	

IS= In Support IO-In opposition AIMA= As Interest May Appear